WHAT IS CLAIMED IS:

1. A method of repairing a gas turbine engine compressor blade airfoil, said method comprising:

removing titanium alloy material from along leading and trailing edges of the airfoil, and along a radially outer tip of the airfoil to form respective leading edge, trailing edge, and tip cut-backs which each define cut-back depths;

depositing titanium weld material onto the leading edge, trailing edge, and tip cut-backs; and

removing at least some of the titanium weld material to obtain pre-desired finished dimensions for the leading and trailing edges, and radially outer tip.

2. A method in accordance with Claim 1 wherein removing titanium alloy material further comprises machining away titanium alloy material along only the radially outermost portions of the leading and trailing edges extending from the tip towards a base of the airfoil.

3. A method in accordance with Claim 2 wherein machining away titanium alloy material along only the radially outermost portions of the leading and trailing edges further comprises forming a rounded corner between the leading edge and trailing edge cut-backs and un-machined portions of the airfoil extending between the leading and trailing edge outermost portions and the base of the airfoil.

4. A method in accordance with Claim 3 wherein forming a rounded corner between the leading edge and trailing edge cut-backs and un-machined portions of the airfoil further comprises forming a semi-circular corner that has a predetermined arc and radius of curvature.

5. A method in accordance with Claim 2 wherein machining away titanium alloy material along only the radially outermost portions of the leading and trailing edges further comprises machining away titanium alloy material along a length of about half a span of the airfoil between the tip and the base of the airfoil.

6. A method in accordance with Claim 2 wherein machining away titanium alloy material along only the radially outermost portions of the leading and trailing edges further comprises blending the titanium weld material.

7. A method in accordance with Claim 2 wherein machining away titanium alloy material along only the radially outermost portions of the leading and trailing edges further comprises contouring the leading edge.

8. A method for repairing a gas turbine engine rotor blade, wherein the rotor blade includes an airfoil, said method comprises:

uncoupling a compressor rotor blade from the gas turbine engine;

machining titanium alloy material from along leading and trailing edges of the airfoil, and along a radially outer tip of the airfoil such that respective leading edge, trailing edge, and tip cut-backs are formed;

depositing titanium weld material onto each respective leading edge, trailing edge, and tip cut-backs; and

contouring the titanium weld material such that the repaired compressor rotor blade has a contour that substantially mirrors that of the original compressor rotor blade contour.

9. A method in accordance with Claim 8 wherein machining titanium alloy material further comprises machining away titanium alloy material from along only the radially outermost portions of the leading and trailing edges extending from the tip towards a base of the airfoil.

10. A method in accordance with Claim 9 wherein machining titanium alloy material along only the radially outermost portions of the leading and trailing edges further comprises forming a rounded corner between the leading edge and trailing edge cut-backs and un-machined portions of the airfoil extending between the leading and trailing edge outermost portions and the base of the airfoil.

11. A method in accordance with Claim 10 wherein forming a rounded corner between the leading edge and trailing edge cut-backs and un-machined portions of the airfoil further comprises forming a rounded corner that has a substantially semi-circular cross-sectional profile.

12. A method in accordance with Claim 10 wherein machining away titanium alloy material along only the radially outermost portions of the leading and trailing edges further comprises machining away titanium alloy material along a length of about half a span of the airfoil between the tip and the base of the airfoil.

13. A method in accordance with Claim 9 wherein machining away titanium alloy material along only the radially outermost portions of the leading and trailing edges further comprises blending the titanium weld material.

14. A method in accordance with Claim 9 wherein depositing titanium weld material onto each respective leading edge, trailing edge, and tip cut-backs further comprises using a plasma-arc weld process to deposit the titanium weld material.

15. A method for replacing a portion of a gas turbine engine rotor blade, the rotor blade including an airfoil having a leading edge, a trailing edge, a first sidewall, and a second sidewall, wherein the first and second sidewalls define an airfoil contour, said method comprising:

machining titanium alloy material from along the airfoil leading and trailing edges, and along a radially outer tip of the airfoil such that respective leading edge, trailing edge, and tip cut-backs are formed;

depositing titanium weld material onto each respective leading edge, trailing edge, and tip cut-backs; and

contouring the titanium weld material such that the repaired airfoil has a contour that substantially mirrors that of the airfoil original contour.

16. A method in accordance with Claim 15 wherein machining titanium alloy material further comprises machining titanium alloy material from along only the radially outermost portions of the leading and trailing edges extending from the tip towards a base of the airfoil, such that a rounded corner is formed between the leading edge and trailing edge cut-backs and un-machined portions of the airfoil.

17. A method in accordance with Claim 16 wherein machining titanium alloy material from along only the radially outermost portions of the leading and trailing edges further comprises machining the radially outermost portions of the leading and trailing edges such that the rounded corner that is formed has a substantially semi-circular cross-sectional profile.

18. A method in accordance with Claim 16 wherein machining titanium alloy material along only the radially outermost portions of the leading and trailing edges further comprises machining titanium alloy material along a length of about half a span of the airfoil between the tip and the base of the airfoil.

19. A method in accordance with Claim 16 wherein machining titanium alloy material along only the radially outermost portions of the leading and trailing edges further comprises blending the titanium weld material.